PHYSICS NMDCAT

TOPIC WISE TEST (UNIT–10)

TOPICS:
- ✓ **Electronics**
- ✓ **Dawn of Modern Physics**

Q. 1 Indivisible tiny bundles of energy in electromagnetic radiation is named as
A. γ-ray
B. Spectrum
C. Photon
D. β-rays

Q. 2 The quanta of energy possessed by γ-radiation is of the order of
A. eV
B. MeV
C. keV
D. None

Q. 3 To detect a signal of radio wave_____ of photons are needed.
A. One
B. Infinite no
C. Few hundred
D. Millions

Q. 4 Energy of photon is **E** and planck's constant is **h** the angular frequency of electromagnetic wave is

A. $\dfrac{E}{h}$

B. $\dfrac{E}{2\pi h}$

C. $\dfrac{2E}{h}$

D. $\dfrac{2\pi E}{h}$

Q. 5 The energy of a photon in a beam of infrared radiation of wave length 1240 nm is about
A. 1.5 MeV
B. 1 eV
C. 1 MeV
D. 1.5 eV

Q. 6 The momentum of photon is

A. $\dfrac{h}{c}$

B. $\dfrac{hc}{\lambda}$

C. $\dfrac{h}{\lambda}$

D. Both B and C

Q. 7 The value of Planck's constant can be determine by equation (E = energy, λ = wavelength)

A. $h = \dfrac{E}{\lambda}$

B. $h = \dfrac{Ec}{\lambda}$

C. $h = \dfrac{E\lambda}{c}$

D. $h = \dfrac{\lambda c}{E}$

Q. 8 During the interval $0 \to \dfrac{T}{2}$ the forward biased diode offers

A. Very small resistance
B. Very high resistance
C. Very small current flow through it
D. Zero resistance

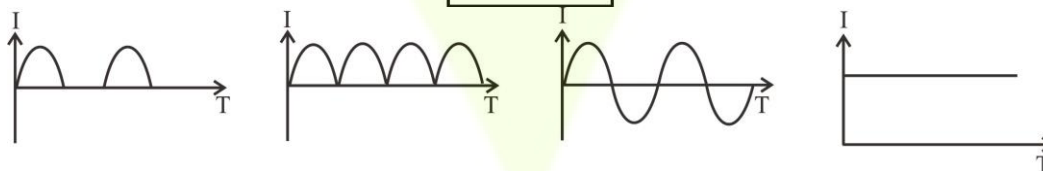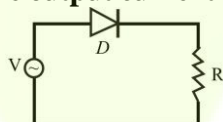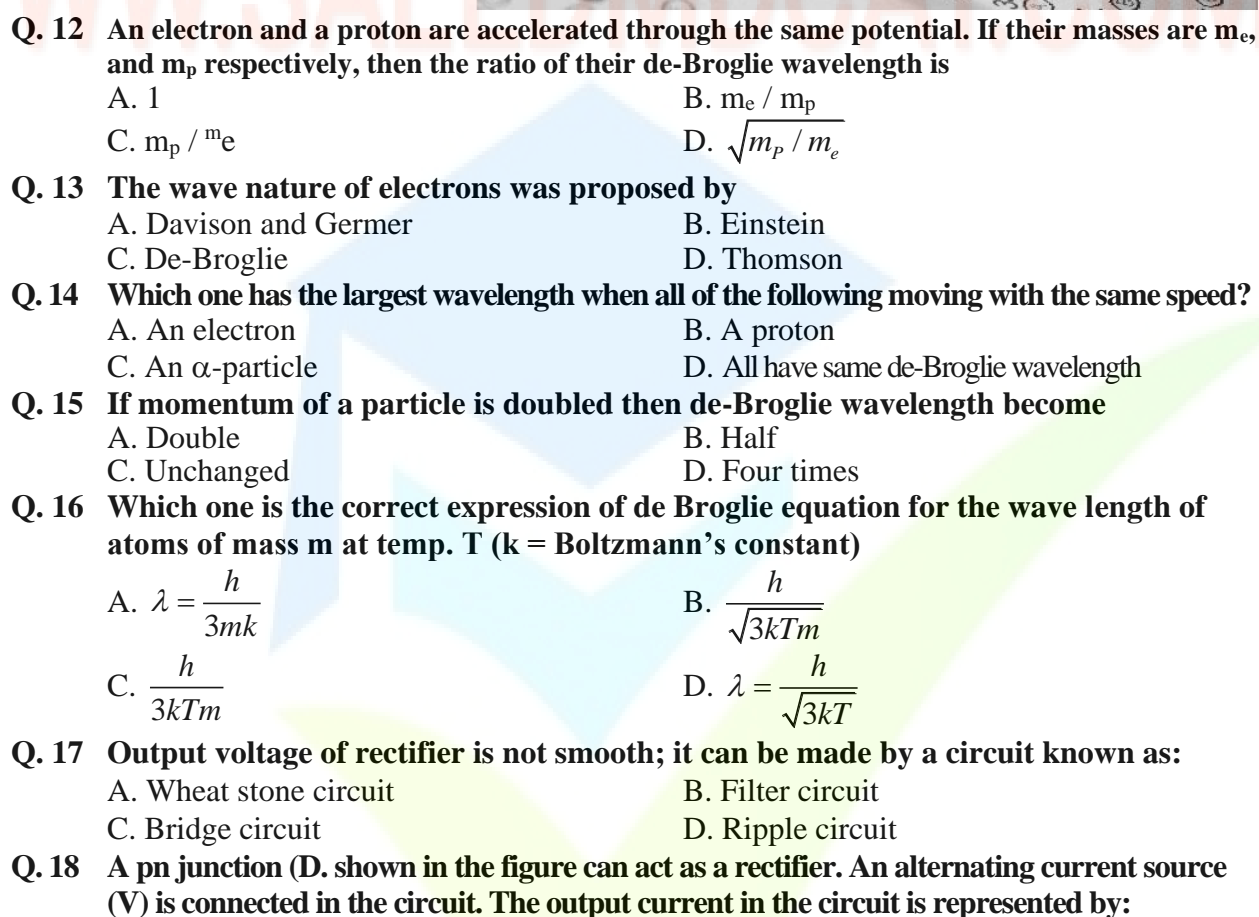**Q. 9** The voltage which appears across load resistance R is called
A. Input voltage
B. Output voltage
C. Reverse voltage
D. Zero voltage

Q. 10 The de-Broglie wavelength of the particle of mass m and energy E is

A. $\lambda = \dfrac{h}{\sqrt{2mE}}$

B. $\lambda = h\sqrt{2mE}$

C. $\lambda = \dfrac{\sqrt{2mE}}{h}$

D. $\lambda = \dfrac{1}{h\sqrt{2mE}}$

Q. 11 A proton and an α-particle are accelerated through same voltage, the ratio of their de-Broglie wavelength will be
A. 1:2
B. $2\sqrt{2}:1$
C. $\sqrt{2}:1$
D. 2:1

Q. 12 An electron and a proton are accelerated through the same potential. If their masses are m_e, and m_p respectively, then the ratio of their de-Broglie wavelength is

A. 1

B. m_e / m_p

C. m_p / m_e

D. $\sqrt{m_p / m_e}$

Q. 13 The wave nature of electrons was proposed by

A. Davison and Germer

B. Einstein

C. De-Broglie

D. Thomson

Q. 14 Which one has the largest wavelength when all of the following moving with the same speed?

A. An electron

B. A proton

C. An α-particle

D. All have same de-Broglie wavelength

Q. 15 If momentum of a particle is doubled then de-Broglie wavelength become

A. Double

B. Half

C. Unchanged

D. Four times

Q. 16 Which one is the correct expression of de Broglie equation for the wave length of atoms of mass m at temp. T (k = Boltzmann's constant)

A. $\lambda = \dfrac{h}{3mk}$

B. $\dfrac{h}{\sqrt{3kTm}}$

C. $\dfrac{h}{3kTm}$

D. $\lambda = \dfrac{h}{\sqrt{3kT}}$

Q. 17 Output voltage of rectifier is not smooth; it can be made by a circuit known as:

A. Wheat stone circuit

B. Filter circuit

C. Bridge circuit

D. Ripple circuit

Q. 18 A pn junction (D. shown in the figure can act as a rectifier. An alternating current source (V) is connected in the circuit. The output current in the circuit is represented by:

A.   B.   C.   D.

Q. 19 In half wave rectifier, the output voltage is taken across_____

A. Diode

B. Resistor

C. Input voltage

D. Capacitor

Q. 20 During the Davisson-Germer experiment what was proved

A. Particle nature of light

B. Wave nature of particle

C. Both A and B

D. None

Q. 21 In a half wave rectifier, the current through load resistance flows only in

A. Positive half cycle

B. Both half cycles

C. Negative half cycle

D. One half cycle

Q. 22 The most common device used as filter is

A. Capacitor

B. Transformer

C. Resistor

D. Transistor

Q. 23 Output of half wave rectifier is suitable only

A. To operate radio

B. Charging batteries

C. For running a D.C motor

D. All of these

Q. 24 A photon of frequency f has a momentum associated with it. If c is the velocity of light, this momentum is

A. $\dfrac{hf}{c^2}$

B. $\dfrac{f}{c}$

C. $\dfrac{hf}{c}$

D. hfc

Q. 25 What wavelength must electromagnetic radiation have if a photon in the beam is to have the same momentum as an electron moving with speed v?

A. $\dfrac{h}{mv}$

B. mvh

C. mvr

D. Not possible

Q. 26 A material particle with a rest mass m_0 is moving with speed of light c. The associated de-Broglie wavelength is given by
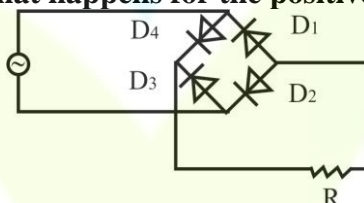
A. ∞

B. 0

C. $\dfrac{m_0 c}{h}$

D. $\dfrac{h}{m_0 c}$

Q. 27 In the given figure the current through the resistor is practically.
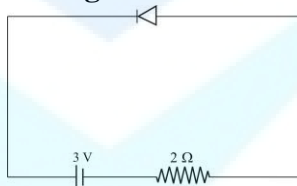
A. 5 A

B. 2 A

C. Zero

D. 1 A

Q. 28 In the following figure what happens for the positive half cycle of the input?

A. D_1 and D_3 conducts

B. D_4 and D_2 conducts

C. D_1 and D_2 conducts

D. D_4 and D_3 conducts

Q. 29 Value of $\hbar$

A. 1.05×10^{34} J

B. 1.05×10^{-34} Ns

C. 1.05×10^{-34} Js

D. All

Q. 30 Davisson and Germer indicates_____in their experiment.

A. Electron reflection

B. Electron refraction

C. Electron polarization

D. Electron diffraction

Q. 31 In Davison and Germer experiment, nickel crystal acts as a:

A. Perfect reflector

B. Two dimensional grating

C. Perfect absorber

D. Three dimensional grating

Q. 32 In Davison and Germer experiment, the angle between incident beam and diffracted beam is called:

A. Angle of incidence

B. Angle of diffraction

C. Glancing angle

D. Angle

Q. 33 A particle of mass M at rest decays into two masses m_1 and m_2 with equal speed in opposite direction. The ratio of de-Broglie wave lengths of the particles $\dfrac{\lambda_1}{\lambda_2}$ is

A. $\dfrac{m_2}{m_1}$

B. $\dfrac{\sqrt{m_1}}{\sqrt{m_2}}$

C. $\dfrac{m_1}{m_2}$

D. 1 : 1

Q. 34 A transmitter radiates 30 µW at 6.63 mm wavelength. The number of photons emitted per second are:

A. 6.63×10^{-34}

B. 6.63×10^{34}

C. 10^{18}

D. 10^{11}

Q. 35 A photon is _____

A. A unit of energy

B. A positively charged particle

C. A quantum of electromagnetic radiation

D. A unit of wavelength

Q. 36 For single phase supply frequency of 50 Hz, ripple frequency in full wave rectifier is
A. 25 Hz
B. 100 Hz
C. 50 Hz
D. 200 Hz

Q. 37 In an half wave rectifier, the input sine wave is $250\sin100\,\pi t$. The output ripple frequency of rectifier will be
A. 100Hz
B. 50Hz
C. 200Hz
D. 25Hz

Q. 38 Rectifier allows unidirectional current through load during entire 360° of input cycle is
A. halfwave rectifier
B. comparator
C. full wave rectifier
D. amplifier

Q. 39 A semi-conductor can be used as a rectifier because
A. It has low resistance to the current flow when forward biased
B. It has low resistance to the current flow when forward biased and high resistance when reversed biased
C. It has low resistance to the current flow when reversed biased
D. None of above

Q. 40 Frequency of photon having energy 66 eV is
A. 8×10^{-15}Hz
B. 16×10^{15}Hz
C. 12×10^{-15}Hz
D. None of these

Q. 41 If the energy of the photon is increased by a factor of 4, then its momentum
A. Does not change
B. Increases by a factor of 4
C. Decreases by a factor of 4
D. Decreases by a factor of 2

Q. 42 Wavelength of a 1 keV photon is $1.24\times10^{-9}m$. What is the frequency of 1 MeV photon?
A. $1.24\times10^{15}Hz$
B. $1.24\times10^{18}Hz$
C. $2.4\times10^{20}Hz$
D. $2.4\times10^{23}Hz$

Q. 43 The frequency of a photon, having energy 100 eV is ($h=6.610^{-34}J\text{-}sec$)
A. $2.42\times10^{26}Hz$
B. $2.42\times10^{12}Hz$
C. $2.42\times10^{16}Hz$
D. $2.42\times10^{9}Hz$

Q. 44 Energy of photon whose frequency is 10^{12}MHz, will be
A. 4.14×10^{3}keV
B. 4.14×10^{3}MeV
C. 4.14×10^{2}eV
D. 4.14×10^{3}eV

Q. 45 Which one has the largest wavelength when all of the following moving with the same speed?
A. An electron
B. A proton
C. An α-particle
D. All have same de-Broglie wavelength

Q. 46 Which of the following has lower energy quanta?
A. X-rays
B. Ultra-violet
C. Radio waves
D. γ-rays

Q. 47 An atomic particle of mass m moving at speed v is found to have wavelength λ. What is the wavelength of second particle with three times the speed and twice the mass?
A. $\dfrac{3\lambda}{2}$
B. 6λ
C. $\dfrac{2\lambda}{3}$
D. $\dfrac{\lambda}{6}$

Q. 48 A photon in motion has a mass
A. $\dfrac{c}{hf}$
B. hf
C. $\dfrac{h}{f}$
D. $\dfrac{hf}{c^{2}}$

Q. 49 The energy of a photon of wavelength λ is
A. hcλ
B. hc/λ
C. λ/hc
D. hλ/c

Q. 50 What will be the ratio of de-Broglie wavelengths of proton and alpha particle of same energy
A. 2 : 1
B. 1 : 2
C. 4 : 1
D. 1 : 4

Chemistry

1- B	11- D	21- D	31- D	41- D
2- C	12- A	22- B	32- D	42- C
3- C	13- A	23- C	33- C	43- B
4- D	14- D	24- B	34- D	44- B
5- B	15- C	25- D	35- B	45- C
6- C	16- B	26- B	36- C	46- A
7- A	17- D	27- B	37- C	47- B
8- C	18- B	28- B	38- B	48- C
9- C	19- D	29- B	39- D	49- D
10- B	20- B	30- A	40- A	50- B

Physics

1- C	11- B	21- D	31- D	41- B
2- B	12- D	22- A	32- C	42- C
3- D	13- B	23- B	33- D	43- C
4- D	14- A	24- C	34- C	44- D
5- B	15- B	25- A	35- A	45- A
6- C	16- B	26- B	36- B	46- C
7- C	17- A	27-	37- B	47- D
8- A	18- A	28- B	38- C	48- D
9- B	19- B	29- C	39- B	49- B
10- A	20- B	30- D	40- B	50- A